SMHI
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AlgAware

ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Abstract

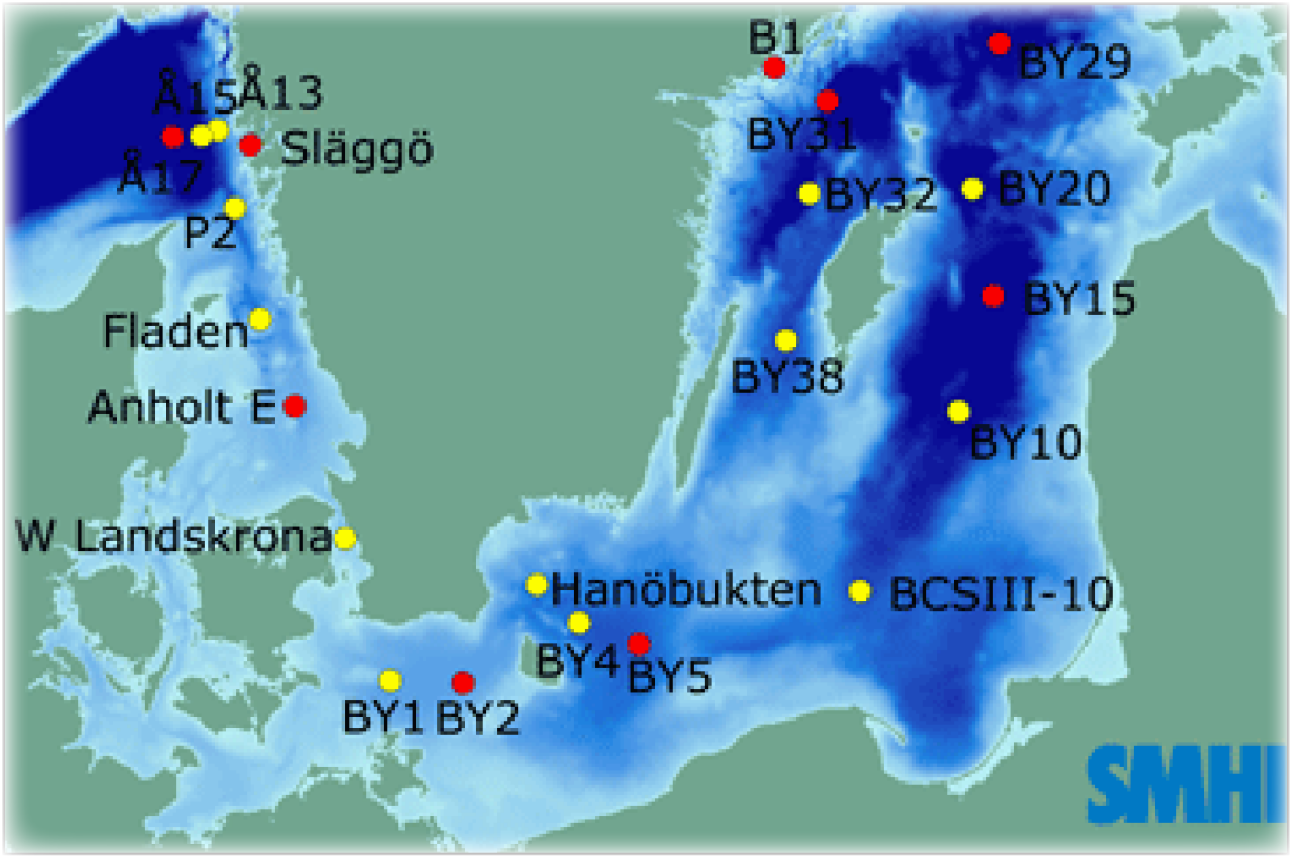
A more autumn like phytoplankton community with more dinoflagellates was observed in the Skagerrak. The same phenomenon was not observed in the Kattegat. Only a few species and few cells were found in the Skagerrak waters at the ordinary phytoplankton stations. This was evident from the quite low fluorescence found at all stations. However, a quite diverse community was observed in the northern part of Skagerrak, at Å13, mostly containing dinoflagellates.

No surface aggregations of cyanobacteria were observed during the expedition. Quite many filaments of *Nodularia spumigena* and *Aphanizomenon* sp. were however observed in the eastern part and northern part of the Baltic Sea as well as the north part of the Kalmar Sound.

To follow the development of filamentous cyanobacteria aggregations visit
http://www.smhi.se/vadret/hav-och-kust/algsituationen-1.11383.

The phytoplankton samples was analysed directly on board the ship during this expedition. The samples were filtrated on to a 10µm polycarbonate filter and analysed under a light microscope. This method makes it difficult to identify small species. Samples from the surface were collected at all stations during this expedition in order to observe which cyanobacteria that occurs in the surface. Potential harmful algae are marked with red in the table further on in the report.

Chlorophyll *a* had not been analysed at the time of writing and therefore not reported here.



Map showing sampling stations. The red are part of the national programme (by Stockholm marine research center and SMHI), the yellow are part of the SMHI off shore programme.

More detailed information on species composition and abundance.

The Skagerrak

Å17 16/8
Only few species were found. Dinoflagellates dominated. The genus *Ceratium* was most common with a dominance of *C. fusus*. The diatom *Proboscia alata* was also found. A small fluorescence peak was found at 20-30 meters and *C. fusus* was most common here as well together with the diatom genus *Rhizosolenia*.

Släggö 16/8
Dinoflagellates dominated and the potentially toxic *Prorocentrum micans* were found in relatively high numbers together with quite high cellnumbers of *Dinophysis acuminata*. A couple of cells of the toxic genus *Alexandrium* were also observed. No fluorescence peak was found.

The Kattegat

N14 17/8
A quite diverse community was found containing both diatoms and dinoflagellates. Different species of the genus *Ceratium* mostly *C. tripos* and *C. fusus* dominated among the dinoflagellates. The diatoms were dominated by the potentially toxic genus *Pseudo-nitzschia* but different *Chaetoceros* species were also common.

Anholt E 17/8-2010 and 21/8
A mixed community with both diatoms and dinoflagellates were observed on the first sampling occasion. *C. tripos* and *C. fusus* were still dominating the dinoflagellates whereas *Proboscia alata* dominated the diatoms. Worth mentioning is that a few filaments of the cyanobacteria *Nodularia spumigena* were found. A small fluorescence peak was observed at 15 meters and contained *C. tripos* and *C. fusus*. It seemed like more dinoflagellates were present compared to diatoms on the second sampling occasion. The same species was however more or less observed.

W Landskrona 17/8
A relatively rich plankton community was observed. Both diatoms and dinoflagellates were found in equal amounts. *Dactyliosolen fragilissimus* was most abundant among the diatoms. The potentially harmful *Prorocentrum minimum* was most abundant among the dinoflagellates. A lot of different ciliates were also observed, among others *Mesodinium rubrum*.

The Baltic Sea

Short summery of the occurrence of filamentous cyanobacteria
No surface aggregations of cyanobacteria were found in the Baltic Sea on this expedition. Only some filaments of *Aphanizomenon* sp. and *Anabaena* sp. was observed in the southwestern part at station BY2. A lot of filaments of both *Nodularia spumigena* and the genus *Aphanizomenon* were however observed at the eastern and northern parts of the Baltic Sea as well as the northern part of Kalmar Sound. Comparison between bucket samples and integrated samples indicated that most cells were distributed in the whole water column between 0-10 meters.

Results from the integrated (0-10 m) phytoplankton samples and chlorophyll fluorescense peak samples.

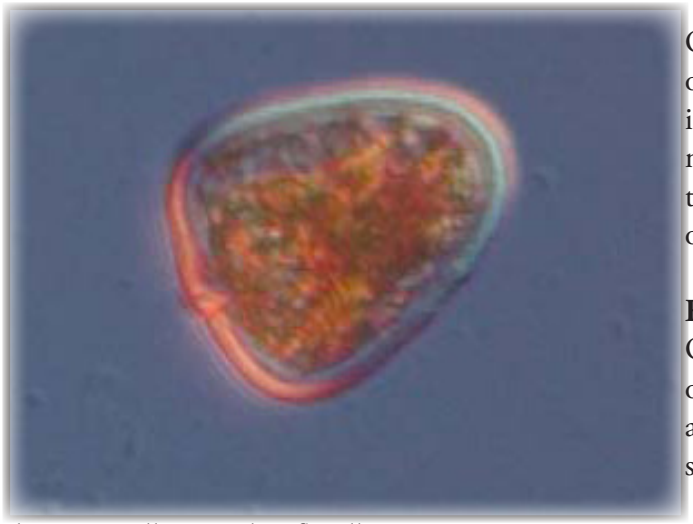
Arkona Basin BY2 18/8
Only a few filaments of the cyanobacteria *Aphanizomenon* sp. and *Anabaena* sp. were observed in the surface sample. The integrated sample (0-10 meters) contained different ciliates in quite high amounts among others *Mesodinium rubrum* together with the diatoms *Chaetoceros impressus* and *C. danicus*.

Bornholm Basin BY5 18/8
No filamentous cyanobacteria were found. A lot of ciliates were once again occurring. A few cells of the diatom genus *Thalassiosira* were also found in an otherwise poor sample.

South eastern Baltic BCS III-10 18/8
Quite many filaments of the cyanobacteria *Aphanizomenon* sp. were found in the surface. Even more were found in the integrated sample indicating that the filaments were not confined to the surface. Ciliates were still abundant especially *Helicostomella* sp. was abundant in the integrated sample.

South Eastern Gotland Basin BY10 19/8
Only surface sample was collected and a few filaments of *Aphanizomenon* sp. were observed.

Eastern Gotland Basin BY15 19/8



The potentially toxic dinoflagellate, *Prorocentrum minimum*, was found at a couple of stations in the Baltic Sea.

Quite a few filaments of *Nodularia spumigena* were observed. A comparison between surface sample and the integrated sample indicated that the filaments occurred mostly at the surface. A quite high amount of cells of the potentially harmful *Prorocentrum minimum* was also observed at this station.

Fårö Deep BY20 19/8
Only a surface sample was collected. Quite many filaments of *N. spumigena* were observed. *Aphanizomenon* sp. was also quite abundant but only a few filaments of *Anabaena* sp. were found.

Norrköping Deep BY32 19/8
Only a surface sample was collected. Filaments of both *N. spumigena* and *Aphanizomenon* sp. were observed in high numbers whereas *Anabaena* sp. was less common. The fluorescence at this station was a bit higher than at the other stations.

Western Gotland Basin BY38 19/8
Filaments of both *N. spumigena* and *Aphanizomenon* sp. were observed in relatively high numbers. However *N. spumigena* seemed to be decomposing as the filaments were looking quite pale. Comparison between surface and integrated samples indicated that the filaments were found in the whole water column between 0-10 meters.

Blå Jungfrun Northern Kalmar Sound 20/8
Quite many filaments of *N. spumigena* and *Aphanizomenon* sp. were also recorded at this station. Many of the *Nodulara* filaments were however pale and seemed like they had started to decompose. Quite a few cells of the harmful dinoflagellate *Dinophysis acuminata* were also observed.

Kalmar Sound Ref. M1-V1 20/8
Only a few pale filaments of *N. spumigena* were observed together with a few cells of *Aphanizomenon* sp.. Comparison between samples indicated that the filaments were distributed between 0-10 meters. Some cells of the dinoflagellate *Heterocapsa triquetra* were also observed at this station.

Phytoplankton analysis and text by:
Marie Johansen

Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	16/8	16/8	17/8	17/8	21/8
Hose 0-10 m	cells/l	cells/l	cells/l	cells/l	cells/l
Ceratulina pelagica			present		
Chaetoceros affinis			present		
Chaetoceros brevis			present		
Chaetoceros danicus			present		present
Chaetoceros spp.		present	common		present
Dactyliosolen fragilissimus			present	present	
Proboscia alata	present		present	common	present
Pseudo-nitzschia spp.			common		
Rhizosolenia spp.	present			present	
Alexandrium sp.		present			
Ceratium fusus	common	present	common	common	common
Ceratium longipes	present				
Ceratium tripos	present	present	common	present	common
Diplopsalis complex	present				
Dinophysis acuminata		common			
Dinophysis rotundata	present		present	present	
Gonyaulax verior		present			
Gymnodiniales spp.			present	present	present
Lingulodinium polyedrum			present		present
Prorocentrum micans	present	common	present	present	present
Protoperidinium conicum		present	present	present	present
Protoperidinium oblongum			present		present
Protoperidinium steinii			present	present	present
Protoperidinium spp.		present	present	present	present
Scrippsiella complex	present				
Pterosperma spp.			present		
Anabaena sp.			present	present	
Nodularia spumigena				present	present
Dictyocha speculum		present			

Selection of observed species	BY2	BY5	BCS III-10	BY15	BY38	Blå Jungfrun	Ref. M1-V1
Red=potentially toxic species	18/8	18/8	18/8	19/8	19/8	20/8	20/8
Hose 0-10 m	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
Chaetoceros danicus	present		present				
Chaetoceros impressus	present		present	present			
Chaetoceros spp.				present			
Chaetoceros wighamii						present	
Thalassiosira spp.		present					
Dinophysis acuminata					present	present	present
Dinophysis rotundata					present	present	
Gymnodinium spp.					present		
Heterocapsa triquetra	present				present	present	present
Prorocentrum minimum				common		present	
Protoperidinium spp.		present					
Teleaulax spp.	present	present	present				
Mesodinium rubrum	common	common	present		present	present	present
Planctonema lauterbornii					present	present	
Ebria tripartita			present			present	present
Anabaena sp.				present	present	present	present
Aphanizomenon sp.			common	present	common	common	common
Nodularia spumigena				common	common	common	present

Surface sampling using a bucket.	Observations of the following filamentous cyanobacteria:		
Station:	Aphanizomenon sp.	Nodularia spumigena*	Anabaena sp.
BY2	present		present
BCS III-10	common		
BY10	common		
BY15	common	common	present
BY20	common	common	present
BY32	common	common	present
BY38	common	common	present
Blå Jungfrun	common	common	present
Ref M1 V1	common	present	present
Hanö bight	present	present	

NB! The amounts of cyanobacteria in the surface vary due to diurnal rhythms.

About AlgAware

SMHI carries out monthly cruises with R/V Argos in the Baltic and the Kattegat/Skagerrak. Results from semi quantitative microscopic analysis of phytoplankton samples as well as chlorophyll measurements are presented in brief in this report. Information from SMHI:s satellite monitoring of algal blooms is found on www.smhi.se.

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
Alexandrium spp.	Paralytic shellfish poisoning (PSP)	**Milda symptom:** Inom 30 min.: Stickningar eller en känsla av bedövning runt läpparna, som sprids gradvis till ansiktet och nacken; stickningar i fingertoppar och tår; Huvudvärk; yrsel, illamående, kräkningar, diarré **Extrema symptom:** Muskelförlamning; andningssvårigheter; känsla av att kvävas; Man kan vara död inom 2-24 timmar efter att ha fått i sig giftet, på grund av att andningsmuskulaturen förlamas.	**Mild case:** Within 30 min: tingling sensation ro numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headake, dizziness, nausea, vomiting, diarrhoea. **Extreme case** Muscular paralysis; pronounced respiratory difficulty; choking sensation; death trough respiratory paralysis may occur within 2-24 hours after ingestion.
Dinophysis spp.	Diarrehetic shellfish poisoning (DSP)	**Milda symptom:** Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont **Extrema symptom:** Upprepad exponering kan orsaka cancer	**Mild case:** Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. **Extreme case:** Repeated exposure may cause cancer.
Pseudochattonella spp.	Fish toxin	**Låg celltäthet:** Ingen påverkan. **Hög celltäthet:** Fiskens gälar skadas, fisken dör.	**Low cell numbers:** No effect on fish. **High cell numbers:** Fish death due to gill damage.
Pseudo- nitzschia spp.	Amnesic shellfish poisoning (ASP)	**Milda symptom:** Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper **Extrema symptom:** Yrsel, hallucinationationer, förvirring, förlust av korttidsminnet, kramper	**Mild case:** Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. **Extreme case:** dizziness, hallucinations, confusion, loss of memory, cramps.

Overview of potentially harmful algae and effects of toxins. Manual on harmful marine microalgae (2003 - UNESCO Publishing).